5.16 PUBLIC HEALTH AND SAFETY

The Project includes the construction, operation, maintenance, and abandonment of up to 850 megawatts (MW) of capacity by a solar power generating facility and its ancillary systems in two phases (Phase I: 500MW [approximately 5,838 acres]/Phase II 350MW [approximately 2,392 acres]). The Project will consist of up to approximately 34,000 SunCatchers. Construction is anticipated to occur over an approximate four-year period beginning in 2010 and ending in 2014. It is estimated that approximately an average of 400 construction and 180 long-term labor jobs will be required.

The Project is located in an undeveloped area of San Bernardino County, California, approximately 37 miles east of Barstow, California and north of Interstate 40 (I-40) between approximately 1,925 to 3,050 feet above mean sea level. The Project is located primarily on Bureau of Land Management (BLM) land within the Barstow Field Office. Approval of the Project Right-of-Way (ROW) Grant Application (Form 299, Applications CACA 49539 and 49537) will result in the issuance of a ROW Grant Permit for use of federal lands administered by the BLM. The Project would require a plan amendment to the 1980 California Desert Conservation Area (CDCA) Plan.

The area where the Project would be constructed is primarily open, undeveloped land within the Mojave Desert. The Cady Mountain Wilderness Study Area (WSA) is located north of the Solar One site. The Pisgah Crater, within the BLM-designated Pisgah area of Critical Environmental Concern (ACEC), is located south and east of the Project (south of I-40 by several miles). Several underground and above ground utilities traverse the areal.

An approved interconnection letter from California Independent Service Operator (CAISO) has been issued for the Project. The associated System Impact Study (SIS) is located in Appendix H. The SIS indicates that additional upgrades to the Southern California Edison (SCE) Lugo-Pisgah No. 2 Transmission Line and upgrades at the SCE Pisgah Substation will be required for the full build out of the 850MW Project. Supplemental studies performed by SCE and CAISO indicate that capacity is available on the existing transmission system to accommodate less than the 850MW Project.

An on-site substation (i.e., Solar One Substation [approximately 3 acres]) will be constructed to deliver the electrical power generated by the Project to the SCE Pisgah Substation. Approximately twelve to fifteen 220kV transmission line structures (90 to 110 feet tall) would be required to make the interconnection from the Solar One Substation to the SCE Pisgah Substation. All of these structures would be constructed within the Project Site.

The Project will include a centrally located Main Services Complex (14.4 acres) that includes three SunCatcher assembly buildings, administrative offices, operations control room, maintenance facilities, and a water treatment complex including a water treatment structure, raw water storage tank, demineralized water storage tank, basins, and potable water tank.

Adjacent to the Main Services Complex, a 14-acre temporary construction laydown area will be developed and an approximately 6-acre construction laydown area will be provided adjacent to the Satellite Services Complex south of the Burlington Northern Santa Fe (BNSF) railroad. Two additional construction laydown areas (26 acres each) one will be located at the south entrance off Hector Road and the other at the east entrance just north of the SCE Pisgah Substation.

Temporary construction site access would be provided off of I-40 beginning east of the SCE Pisgah Substation and would traverse approximately 3.5 miles across the Pisgah ACEC requiring an approximate 30-foot ROW. Long-term permanent access would be provided by a bridge over the BSNF railroad along Hector Road north of I-40. Equipment may be transported during construction via trucks and/or rail car (through the construction of a siding), that would be located on the north side of BNSF railroad and east of Hector Road or as authorized by BNSF.

Water would be provided via a groundwater well located on a portion of the BLM ROW grant north of the Main Services Complex and transported through an underground pipeline. The expected average well water consumption for the Project during construction is approximately 50 acre-feet per year. Under normal operation (inclusive of mirror cleaning, dust control, and potable water usage), water required will be approximately 36.2 acre-feet per year. Emergency water may be trucked in from local municipalities.

This section describes the evaluation of potential impacts from the Project on public health and safety. Because of the nature of a solar power generating facility, there will be only minimal releases of toxic substances to the environment, including very low emissions of toxic air contaminants (TACs) to the atmosphere. In fact, the only emissions of TACs from stationary sources of the operational facility will be short weekly tests of the diesel engine driver for one emergency generator. A health risk assessment (HRA) was conducted to assess the potential health impacts of TAC emissions from this engine. This section describes the methodology and results of the HRA for the Project. Potential public exposure to criteria pollutants emitted by the Project, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), volatile organic compounds (VOC), and particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}) is addressed in Section 5.2, Air Quality. A limited number of hazardous materials will be used during normal operations at the Project facility. These are discussed further in Section 5.15, Hazardous Materials Handling.

The details of the public health analysis are contained in the following sections: Section 5.16.1 describes the local environment surrounding the Project site. There are three sensitive receptors located within 3 miles of the Project site, which all are residences. The locations of these residences are shown in Figure 5.16-1, Sensitive Receptors. Section 5.16.2 discusses the potential public health consequences of the Project, including its emissions of TACs, the HRA technical approach, and quantitative estimates of the maximum potential impacts of these emissions. The results of the HRA show that the maximum incremental offsite cancer risk from the Project will be well below the accepted cancer risk significance threshold for new sources of 10 in 1 million. The results of the assessment also show that the chronic total hazard index (THI) resulting from Project emissions will be well below the accepted significance criterion of 1.0. Section 5.16.3 discusses the cumulative impacts of the Project, as required by the California Energy Commission (CEC). Section 5.16.4 discusses mitigation measures to minimize the impacts of the Project's emissions of TACs; Section 5.16.5 describes all applicable laws, ordinances, regulations, and standards (LORS) pertaining to the public health aspects of the Project; involved agencies and agency contacts consulted in conducting the HRA; and the permits required and the permitting schedule. Section 5.16.6 lists the references used to conduct the public HRA.

5.16.1 Affected Environment

The CEC defines sensitive receptors as infants and children, the elderly, and the chronically ill, and any other member of the general population who is more susceptible to the effects of the exposure than the population at large. Sensitive receptors are defined as the locations occupied by groups of individuals that may be more susceptible to health risks from a chemical exposure, schools (public and private), day care facilities, convalescent homes, parks, and hospitals. Nearby residences are also included in the sensitive receptor analysis. A survey was done of the area within 3 miles of the Project Site, and three residences were found (Figure 5.16-1). Nevertheless, the HRA approach treats all receptors within the modeling grid as sensitive receptors, and maximum health risks were calculated for all points of public access in the Project area.

The San Bernardino County Public Health Department and the Mojave Desert Air Quality Management District (MDAQMD) were consulted to determine if any health studies related to respiratory illnesses, cancers, or related diseases had been conducted within a 6-mile radius of the Project site. An extensive internet search was also conducted. No such health studies were identified for the areas within a 6-mile radius of the Project.

5.16.2 Environmental Consequences

This section describes the potential public health risks due to the construction and operation of the Project, and the methodology and results of the HRA. A potentially significant carcinogenic risk is indicated when the predicted maximum incremental cancer risk is greater than 10 in one million. Non-cancer risk is typically reported as a THI, which is a ratio calculated for each target organ. Specifically, the maximum predicted acute or chronic exposure due to the Project is expressed as a fraction of the corresponding maximum acceptable exposure level for a pollutant. The acceptable exposure level is the level at (or below) which no adverse health effects are expected. Thus, a non-cancer risk is considered significant when a chronic or acute THI above 1.0 is predicted. These significance thresholds are defined by the California Air Resources Board AB2588 program.

5.16.2.1 Public Health Risk Assessment Approach

The potential human health risks posed by the Project's emissions were assessed using procedures consistent with the Office of Environmental Health Hazard Assessment (OEHHA) Air Toxics Hot Spots Program Risk Assessment Guidelines – The Air Toxics Hot Spots Program Guidance Manual for Preparation of HRA (OEHHA, 2003). The OEHHA guidelines were developed to provide risk assessment procedures, as required under the Air Toxics Hot Spots Information and Assessment Act of 1987, Assembly Bill 2588 (Health and Safety Code Sections 44360 *et seq*.). The Hot Spots law established a statewide program for inventorying emissions of toxic air contaminants from individual facilities, as well as requirements for risk assessment and public notification of potential health risks.

The HRA was conducted in three steps by: 1) determining the TAC emitted from the Project; 2) calculating the ground level concentrations for each TAC; and 3) characterizing the health risks, based on the TAC emission rates, "unit" ground-level concentrations, and toxicological data.

The only toxic air contaminant emitted from the operations of the Project is diesel particulate from the testing of the diesel emergency generator engine. Emissions are calculated based on vendor guaranteed PM_{10} emission rates. Diesel particulate only has long-term health risk thresholds, thus only cancer risk and the chronic non-cancer THI were calculated in this HRA. No acute non-cancer reference exposure level (REL) has been established for diesel particulate; thus no acute non-cancer THI was calculated.

Dispersion modeling was performed using the EPA AERMOD model to estimate the ground-level concentrations at the nearest points offsite from the Project. The methods used in the dispersion modeling were consistent with the approach for modeling criteria pollutants from the Project diesel engine, as described in Section 5.2, Air Quality. The AERMOD model was run with data monitored at the Barstow Daggett Airport station for the year 2005. Diesel particulate only has health risk factors for cancer and chronic non-cancer risks, thus only annual ground-level particulate concentrations need to be calculated.

Risk characterization was performed to integrate the health effects and public exposure information and provide quantitative estimates of health risks from Project emissions. Carcinogenic and chronic non-carcinogenic health risks corresponding to the maximum modeled annual diesel particulate concentration were estimated using an Excel spreadsheet. The chronic non-cancer risk is calculated by dividing the annual ground level particulate concentration by the diesel particulate matter chronic reference exposure level (REL) from OEHHA. The cancer risk is calculated by estimating the inhalation dose (mg/kg-day) from the annual ground level particulate concentration, which is then multiplied by the diesel particulate inhalation cancer potency factor from OEHHA. For the calculation of cancer risk, the duration of exposure to the Project's emissions was assumed to be 70 years.

Detailed descriptions of the model input parameters and results of the HRA are presented later in this section and in Appendix DD, Public Health and Safety Data.

5.16.2.2 Construction Phase Emissions

The Project's construction phase would be temporary (i.e., approximately 41 to 48 months), and emissions from construction would cease at the end of the construction period. As such, significant long-term public health effects are not expected since they are evaluated on a long-term basis (i.e.,70 years). To ensure worker safety during actual construction, safe work practices will be followed and all LORs will be adhered to. A detailed analysis of the potential environmental impacts due to criteria pollutant emissions during construction and control of these emissions is discussed in Section 5.2, Air Quality.

5.16.2.3 Operation Emissions

Project operations were evaluated to determine whether particular substances will be used or generated that may cause adverse health effects if released to the air. The only stationary Project sources of TAC emissions are the emergency diesel internal combustion engines that will be used as drivers for the fire water pump and stand-by power generator. The fire water pump and power generator will normally be operated (exercised) for short periods (15 minutes per engine per week) in testing mode to ensure their operability if needed. The PM_{10} emissions were calculated based on a vendor guaranteed emission factor and are presented in Table 5.16-1,

Emission Rates from Normal Testing of the Diesel Emergency Fire Water Pump and Emergency Generator Engines. Detailed emissions calculations can be found in Appendix DD, Public Health and Safety Data.

Table 5.16-1
Emission Rates from Normal Testing of the Diesel Emergency Fire Water Pump and Emergency Generator Engines

Chemical Species	Emission Factor (g/hp-hr)	Maximum Hourly Emission Rate (lb/hr)[1]	Annual Emission Rate (lb/yr)[2]
Emergency Power Generator Engine			
Diesel particulate	0.15	0.11	5.77

Source: EPA, 1992.
Notes:
[1] Hourly emissions include only 15 minute engine operations for testing.
[2] Annual emissions are based on 13 hours of engine operation per year.
g/hp-hr = gram per horsepower hour
lb/hr = pounds per hour
lb/yr = pounds per year

5.16.2.4 Model Input Parameters

The HRA was conducted using the worst-case annual emissions from the diesel emergency generator engine. Stack parameters were obtained from the vendor. Dispersion modeling was performed using the AERMOD model using methods consistent with the approach described in Section 5.2, Air Quality. The diesel particulate cancer potency factors and chronic REL used in the HRA are 1.1 $(mg/kg\text{-}day)^{-1}$ and 5 $(\mu g/m^3)$, respectively.

5.16.2.5 Calculation of Health Effects

Adverse health effects are expressed in terms of cancer or non-cancer health risks. Cancer risk is typically reported as "lifetime cancer risk,." which is the maximum estimated increased risk of contracting cancer caused by long-term exposure to a pollutant suspected of being a carcinogen. Cancer risk is calculated by assuming that an individual is exposed continuously to pollutants at the computed long-term average concentration 24 hours per day for a period of 70 years. Although this continuous lifetime exposure is unlikely, the goal of the approach is to produce a worst-case estimate of potential cancer risk.

The cancer risk is calculated by estimating the inhalation dose (mg/kg-day) from the annual ground level particulate concentration, and then multiplying by the diesel particulate inhalation cancer potency factor from OEHHA. Inhalation dose is calculated using the following equation:

*Inhalation dose (mg/kg-day) = (Annual concentration ($\mu g/m^3$)) * DBR * A * EF * ED * 10^{-6} / AT, where:*

DBR = daily breathing rate (L/kg-day), used 95th percentile = 393
A = Inhalation absorption factor (fraction of chemical absorbed), default = 1
EF = Exposure frequency (days/year) = 52

ED = Exposure duration (years), default = 70
AT = Averaging time period over which exposure is averaged (days), default = 25,550

Non-cancer risk is typically reported as a THI. The THI is calculated for each target organ as a fraction of the maximum acceptable exposure level to a pollutant. The acceptable exposure level is generally the level at (or below) which no adverse health effects are expected. THI in this analysis is calculated for long-term (chronic) exposure by dividing the maximum predicted annual ground level concentration of diesel particulate by the diesel particulate matter chronic REL.

Both the cancer and chronic non-cancer risk estimates provided in this HRA represent incremental risks (i.e., risks due to Project sources only) and do not include potential health risks posed by existing background concentrations. This approach is consistent with the significance criteria used to evaluate predicted impacts, which are also based on the incremental contributions to risk by Project sources. Detailed health risk calculations can be found in Appendix DD, Public Health and Safety Data.

5.16.2.6 Health Effects Significance Criteria

Various state and local agencies use different significance criteria for cancer and non-cancer health effects. For carcinogenic health effects, an exposure to a new emissions source is normally considered potentially significant when the predicted incremental lifetime cancer risk of the source exceeds 10 in 1 million (10×10^{-6}). For non-carcinogenic health effects (chronic or acute), an exposure that affects each target organ is considered potentially significant when the THI exceeds a value of 1.

5.16.2.7 Estimated Lifetime Cancer Risk

Based on the risk assessment methodology described in the foregoing subsections, the maximum incremental cancer risk resulting from the diesel emergency fire water pump and emergency generator engines particulate emissions was estimated to be 0.01 in 1 million. The maximum cancer risk was predicted to occur at the nearest property line, approximately 358 meters southeast of the sources. Cancer risk was not calculated at any of the sensitive receptors since the risk at the point of maximum effect was well below the significance threshold.

Table 5.16-2, Estimated Cancer Risk and Chronic Total Hazard Index, presents the results of the HRA for Project operations for cancer and chronic health risks. All model files, along with all air quality modeling files are provided electronically on a CD that is supplied separately with this Application for Certification.

Table 5.16-2
Estimated Cancer Risk and Chronic Total Hazard Index

Cancer Risk at Point of Maximum Effect	Chronic Risk at Point of Maximum Effect
0.06 excess risk in 1 million	0.00003 Total Hazard Index

Source: EPA, 1992.

The estimated cancer risk at all locations is well below the significance criteria of 10 in 1 million. Thus, it is concluded that the Project's emissions from the diesel emergency generator engine will not pose a significant cancer risk to any population that would potentially be exposed to these emissions.

5.16.2.8 Estimated Chronic and Acute THI

The maximum chronic THI resulting from the Project's emissions was estimated to be 0.00003. The location of the maximum predicted chronic THI is the same as the location of the maximum cancer risk since these risk calculations were both based on the maximum annual PM_{10} concentration. The chronic THI values at the sensitive receptors in the vicinity of the Project would be well below the maximum modeled chronic value at the fenceline.

Table 5.16-2 presents the detailed non-cancer results of the HRA for Project operations. The estimated chronic THI is well below the significance criterion of 1. Thus, it is concluded that the Project's emissions from the diesel emergency generator engine will not pose a significant non-cancer health risk to any population that would potentially be exposed to these emissions.

5.16.2.9 Uncertainty in the Public Health Effect Assessment

Sources of uncertainty in HRAs include emissions estimates, dispersion modeling, exposure characteristics, and extrapolation of toxicity data in animals for application to humans. For this reason, assumptions used in HRAs are designed to provide sufficient health protection to avoid underestimation of health risk to the public. Some sources of uncertainty that are applicable to this HRA are discussed below.

The annual PM_{10} emission rate for the emergency diesel engine was derived using vendor data assuming the anticipated testing schedule at a maximum load for the maximum number of annual operating hours requested in this application. Under actual operating conditions, this engine may operate less and the actual load may be less than 100 percent of capacity. Consequently, the emissions used for this HRA may be higher than those that will actually occur.

The dispersion models used in HRAs contain assumptions that tend to lead toward over-prediction of ground-level contaminant concentrations. The modeling performed in the HRA assumed conservation of mass, i.e. the entire mass of particulate emissions from this engine was assumed to remain airborne during transported downwind, none of the material was assumed to be converted or removed through chemical reaction or lost at the ground surface through reaction, gravitational settling, or turbulent impaction. In reality, these mechanisms work to reduce the level of pollutants remaining in the atmosphere during plume travel. This is especially true for particulate matter.

The exposure characteristics assessed in the HRA included the assumption that all receptors (including residents) were continuously exposed to the emissions from the Project at the same location for 24 hours per day, 365 days per year, for 70 years. It is extremely unlikely that a resident would actually be subject to such continued, long-term exposure. This conservative exposure assumption tends to cause risks to be over estimated by the HRA methods used in this analysis.

The toxicity data used in the HRA contain uncertainties resulting from the extrapolation of health effects data from animals to humans. Typically, safety factors are applied when doing the extrapolation. Furthermore, the human population is much more diverse both genetically and culturally than bred experimental animals. The intraspecies variability among humans is expected to be much greater than in laboratory animals. With all of the uncertainty in the assumptions used to extrapolate toxicity data, significant measures are taken to ensure that there is sufficient health protection built into the health effects criteria used in assessments such as this one.

The conservatism introduced at each step in the HRA to compensate for all of these sources of uncertainty is compounded in the predicted health risks; therefore, the actual risks resulting from exposure to emissions from the Project are expected to be well below the values presented in this analysis.

5.16.2.10 Criteria Pollutants

Impacts resulting from emissions of the criteria pollutants (NO_2, CO, SO_2, and PM_{10}) from the Project's diesel emergency generator engine were evaluated with modeling, as presented in Section 5.2, Air Quality. The National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) specify allowable levels of specific air pollutants that should not be exceeded in order to protect the public health. The results presented in Section 5.2, Air Quality, show that the Project will not cause or significantly contribute to exceedances of any CAAQS or NAAQS. Thus, no significant adverse health effects are anticipated to result from the Project's criteria pollutant emissions.

5.16.3 Cumulative Effects

CEC requirements specify that an analysis must be conducted to determine the cumulative impacts of the Project and other projects within a 6-mile radius that have recently received construction permits but are not yet operational, or that are currently in the permitting process or can be expected to do so in the near future. There are no such other new potential sources of TAC within 6 miles of the Project; thus no additional cumulative analysis will be conducted.

5.16.4 Mitigation Measures

The criteria pollutant and TAC emissions from the Project's sources, the diesel emergency generator engine, will be mitigated by using clean EPA Tier 3 diesel engines. A discussion of the emission limits pertaining to the Project's emergency diesel engine is included in Section 5.2, Air Quality.

The HRA presented in the foregoing subsections shows that the health effect impacts of the Project as proposed will be well below the significance thresholds identified in Section 5.16.2.6; therefore, no further mitigation of emissions from the Project is required to protect public health.

5.16.5 Compliance with LORS

The Project will comply with all applicable public health and safety LORS.

Table 5.16-3
Summary of LORS – Public Health and Safety

LORS	Administering Agency	Requirement	Project Compliance
Federal Jurisdiction			
Clean Air Act	EPA CARB ICAPCD	Protect public from unhealthful exposure to air pollutants.	Based on the results of the risk assessment, air toxics emissions from the Project will not exceed acceptable levels (Section 5.16, Public Health and Safety). Emissions of criteria pollutants will be minimized by using EPA Tier 3 diesel engines (Section 5.2, Air Quality).
State Jurisdiction			
California Public Resource Code § 25523(a); 20 CCR § 1752.5, 2300-2309, and Division 2 Chapter 5, Article 1, Appendix B, Part(1)	CEC	Assure protection of environmental quality, requires quantitative HRA.	The HRA in Section 5.16, Public Health and Safety, of this application satisfies this requirement.
California Clean Air Act, TAC Program, CHSC § 39650, *et seq.*	ICAPCD with CARB oversight	Requires quantification of TAC emissions and preparation of an HRA.	The Project will not cause unsafe exposure to TACs based on results of the HRA.
CHSC, Part 6, § 44300 *et seq.* (Air Toxics Hot Spots)	ICAPCD with CARB/OEHHA oversight	Regulates public exposure to air toxics. Requires inventory of TACs and HRA.	The HRA presented in this section of this Application for Certification satisfies this requirement, although participation in the California Hot Spots program is not required due to the negligible TAC emissions from the emergency engines.
CHSC § 41700	ICAPCD with CARB oversight	Prohibits emissions in quantities that adversely affect public health, other businesses or property.	Section 5.2, Air Quality, and the HRA presented in this Application for Certification satisfy this requirement.
Local Jurisdiction			
MDAQMD Rule 1302	MDAQMD	New Source Review for Toxic Air Contaminants.	Use of EPA Tier 3 diesel engines satisfies this requirement as described in Section 5.2, Air Quality.

Source: Stirling Energy Systems, Inc. 2008

Notes:
CARB = California Air Resources Board
CCR = California Code of Regulations
CEC = California Energy Commission
CHSC = California Health & Safety Code
HRA = health risk assessment
LORS = laws, ordinances, regulations, and standards
OEHHA = Office of Environmental Health Hazard Assessment
TAC = toxic air contaminant
EPA = Environmental Protection Agency
T-BACT = Toxic-Best Available Control Technology

5.16.5.1 Agencies and Agency Contacts

Agency contacts regarding the public health assessment of the Project are listed in Table 5.16-4, Agency Contact List for LORS.

Table 5.16-4
Agency Contact List for LORS

	Agency	Contact	Address	Telephone
1	California Energy Commission	Keith Golden	Air Quality Specialist 1516 Ninth Street Sacramento, CA 95814	916-654-4287
2	California Air Resources Board	Mike Tollstrup	1001 I Street Sacramento, CA 95814	916-322-6026
3	Mojave Desert Air Quality Management District	Chris Collins	Supervising Air Quality Specialist 15306 Park Avenue Victorville, CA, 92392	(760) 254-2022

Source: Stirling Energy Systems, Inc., 2008
Note:
LORS = laws, ordinances, regulations, and standards

5.16.5.2 Permits Required and Permitting Schedule

The Permit to Operate (PTO) will be issued by the MDAQMD and the CEC's final decision on this AFC will serve as the principal approval required to ensure that the Project's impacts to public health will be within acceptable levels. Award of the Permit to Construct (PTC) is expected to occur within 3 to 6 months after submittal of complete applications to MDAQMD.

Table 5.16-5
Applicable Permits

Responsible Agency	Permit/Approval	Schedule
Mohave Desert Air Quality Management District	Authority to Construct/Permit to Operate	Application to be filed concurrent with Application for Certification filing.

Source: Stirling Energy Systems, Inc. 2008

5.16.6 References

Cal/EPA (California Environmental Protection Agency) and OEHHA (Office of Environmental Health Hazard Assessment). 2003a. Air Toxics Hot Spots Program Risk Assessment Guidelines – The Air Toxics Hot Spots Program Guidance Manual for EPA Preparation of Health Risk Assessments.

_____. 2003b. Air Toxics Hot Spots Risk Assessment Guidelines, Part III: Technical Support Document for the Determination of Non-cancer Chronic Reference Exposure Levels.

_____. 2005. Air Toxics Hot Spots Risk Assessment Guidelines, Part II: Technical Support Document for Describing Available Cancer Potency Factors.

EPA (Environmental Protection Agency). 1992. Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised, EPA-454/R-92-019. October.

OEHHA (Office of Environmental Health Hazard Assessment). 2003. Air Toxics Hot Spots Program Risk Assessment Guidelines. August.

SES Solar Three, LLC and SES Solar Six, LLC. 2008. *Project Description and Plan of Development*.

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Adequacy Issue:	Adequate		Inadequate		**DATA ADEQUACY WORKSHEET**	Revision No.	0	Date	
Technical Area:	**Public Health**			Project:	SES Solar One		Technical Staff:		
Project Manager:				Docket:			Technical Senior:		

SITING REGULATIONS	**INFORMATION**	**AFC SECTION NUMBER**	**ADEQUATE YES OR NO**	**INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS**
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the Project, the measures proposed to mitigate adverse environmental impacts of the Project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Section 5.16.1 Section 5.16.2 Section 5.16.3 Section 5.16.4		
Appendix B (g) (9) (A)	An assessment of the potential risk to human health from the Project's hazardous air emissions using the Air Resources Board Hotspots Analysis and Reporting Program (HARP) (HSC §§44360-44366) or its successor and Approved Risk Assessment Health Values. These values should include the cancer potency values and noncancer reference exposure levels approved by the Office of Environmental Health Hazard Assessment (OEHHA Guidelines, Cal-EPA 2005).	Section 5.16.2		
Appendix B (g) (9) (B)	A listing of the input data and output results, in both electronic and print formats, used to prepare the HARP health risk assessment.	Section 5.16.2 Modeling DVD		
Appendix B (g) (9) (C)	Identification of available health studies through the local public health department concerning the potentially affected population(s) within a six-mile radius of the proposed power plant site related to respiratory illnesses, cancers or related diseases.	Section 5.16.1		
Appendix B (g) (9) (D)	A map showing sensitive receptors within the area exposed to the substances identified in subsection (g)(9)(A).	Figure 5.16-1		

Adequacy Issue:	Adequate		Inadequate		**DATA ADEQUACY WORKSHEET**	Revision No.	0	Date	
Technical Area:	**Public Health**			Project:	SES Solar One		Technical Staff:		
Project Manager:				Docket:			Technical Senior:		

SITING REGULATIONS	**INFORMATION**	**AFC SECTION NUMBER**	**ADEQUATE YES OR NO**	**INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS**
Appendix B (g) (9) (E)	For purposes of this section, the following definitions apply:	See Below		
Appendix B (g) (9) (E) (i)	A sensitive receptor refers to infants and children, the elderly, and the chronically ill, and any other member of the general population who is more susceptible to the effects of the exposure than the population at large;	Section 5.16.1 Figure 5.16-1		
Appendix B (g) (9) (E) (ii)	An acute exposure is one which occurs over a time period of less than or equal to one (1) hour; and	N/A		
Appendix B (g) (9) (E) (iii)	A chronic exposure is one which is greater than twelve (12) percent of a lifetime of seventy (70) years.	Section 5.16.2		
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed Project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	Section 5.16.5		
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Section 5.16.5		

Adequacy Issue:	Adequate		Inadequate		**DATA ADEQUACY WORKSHEET**	Revision No.	0	Date	
Technical Area:	**Public Health**			Project:	SES Solar One		Technical Staff:		
Project Manager:				Docket:			Technical Senior:		

SITING REGULATIONS	**INFORMATION**	**AFC SECTION NUMBER**	**ADEQUATE YES OR NO**	**INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS**
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Section 5.16.5		
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	Section 5.16.5.2		

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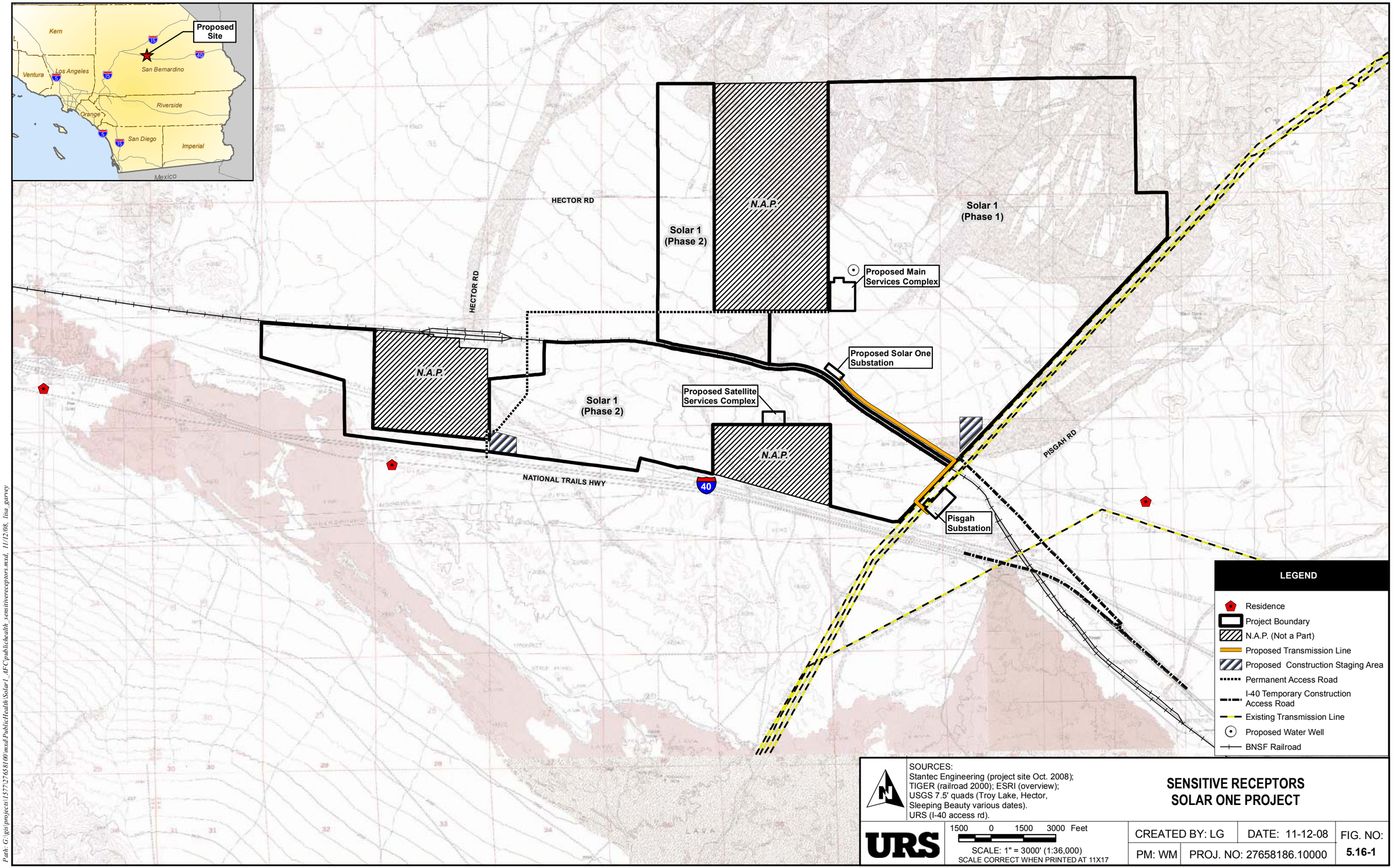

SOURCES:
Stantec Engineering (project site Oct. 2008);
TIGER (railroad 2000); ESRI (overview);
USGS 7.5' quads (Troy Lake, Hector,
Sleeping Beauty various dates).
URS (I-40 access rd).

SENSITIVE RECEPTORS
SOLAR ONE PROJECT

URS

1500 0 1500 3000 Feet

SCALE: 1" = 3000' (1:36,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LG	DATE: 11-12-08	FIG. NO:
PM: WM	PROJ. NO: 27658186.10000	5.16-1

Path: G:\gis\projects\1577\27658100\mxd\PublicHealth\Solar1_AFCpublichealth_sensitivereceptors.mxd, 11/12/08, lisa_garvey